CLAIMS

What is claimed is:

1. A method of producing a hybrid cell that expresses an ectopic telomerase gene comprising fusing a fusion partner cell with a fusion cell under conditions appropriate for the production of a hybrid cell, wherein the ectopic telomerase gene is introduced into one of the cells and is expressed in the hybrid cell, thereby producing a hybrid cell that expresses an ectopic telomerase gene.

2. A method of claim 1 wherein the ectopic telomerase gene is introduced into the fusion partner cell prior to fusing the fusion partner cell with a fusion cell.

3. A method of claim 1 wherein the ectopic telomerase gene is introduced into the fusion cell prior to fusing the fusion cell with a fusion partner cell.

4. A method of claim 1 wherein the ectopic telomerase gene is introduced into the fusion partner cell, fusion cell, or hybrid cell during the cell fusion.

5. A method of claim 1 wherein the ectopic telomerase gene is introduced into the hybrid cell.

6. The method of claim 1, wherein the fusion partner cell is an immortal mammalian cell.

7. The method of claim 6, wherein the fusion partner cell is a human cell or a murine cell.

8. The method of claim 6, wherein the fusion partner cell is a B-lineage cell.

9. The method of claim 6, wherein the fusion partner cell is a myeloma cell line.

10. The method of claim 1, wherein the fusion cell is a B-lineage cell.

11. The method of claim 10, wherein the B-lineage cell is of human origin.

12. The method of claim 1, wherein the telomerase gene is the human telomerase gene.

13. A hybrid cell produced by the method of claim 1.

14. A hybrid cell of claim 13 that ectopically expresses human telomerase.

15. A hybrid cell of claim 13 that ectopically expresses telomerase and produces antibody molecules.

16. A hybrid cell of claim 13, wherein the antibody molecules produced may include immunoglobulin A, immunoglobulin E, immunoglobulin G, immunoglobulin M, or portions and derivatives thereof.

17. A hybrid cell of claim 16 that produces human antibody molecules.

18. A hybrid cell of claim 16 that produces antibody molecules encoded in full or in part by genes originating from the human B-cell fusion cell.

19. A hybrid cell produced by fusing: (a) a mammalian fusion partner that ectopically expresses telomerase and (b) a human B-lymphocyte, wherein the hybrid cell expresses an antibody derived from the human B-lymphocyte.

20. An antibody produced by the hybrid cell of claim 19.

21. A method of producing a hybrid cell that expresses an ectopic telomerase gene comprising fusing an immortal mammalian cell line that expresses an ectopic telomerase gene with a fusion cell under conditions appropriate for the production of hybrid cells, thereby producing a hybrid cell that expresses an ectopic telomerase gene.

22. The method of claim 21, wherein the fusion partner cell is an immortal mammalian cell.

23. The method of claim 22, wherein the fusion partner cell is a human cell or a murine cell.

24. The method of claim 22, wherein the fusion partner cell is a B-lineage cell.

25. The method of claim 22, wherein the fusion partner cell is a myeloma cell line.

26. The method of claim 21, wherein the fusion cell is a B-lineage cell.

27. The method of claim 26, wherein the B-lineage cell is of human origin.

28. The method of claim 21, wherein the telomerase gene is the human telomerase gene.

29. A hybrid cell produced by the method of claim 21.

30. A hybrid cell of claim 29 that ectopically expresses human telomerase.

31. A hybrid cell of claim 29 that ectopically expresses telomerase and produces antibody molecules.

32. A hybrid cell of claim 29, wherein the antibody molecules produced may include immunoglobulin A, immunoglobulin E, immunoglobulin G, immunoglobulin M, or portions and derivatives thereof.

33. A hybrid cell of claim 32 that produces human antibody molecules.

34. A hybrid cell of claim 16 that produces antibody molecules encoded in full or in part by genes originating from the human B-cell fusion cell.

35. An immortal mammalian cell line that expresses an endogenous telomerase gene and an ectopic telomerase gene.

36. The immortal mammalian cell line of claim 35, wherein the cell line is of human or murine origin.

37. The immortal mammalian cell line of claim 36 which has been modified to ectopically express telomerase constitutively by expressing a telomerase gene that is expressed from a constitutively active promoter.

38. An immortal mammalian cell line of B-lineage that expresses an endogenous telomerase gene and an ectopic telomerase gene.

39. The immortal mammalian cell line of claim 38, wherein the cell line is of human or murine origin.

40. The immortal mammalian cell line of claim 39, wherein the ectopically expressed telomerase gene is constitutively expressed.

41. The immortal mammalian cell line of claim 40, wherein the constitutively active promoter is selected from the group consisting of: a viral promoter, a

eukaryotic promoter, a prokaryotic promoter and a synthetic promoter.

42. The immortal mammalian cell line of claim 38, wherein the cells of B cell lineage express Epstein-Barr Virus antigens.

43. An immortal mammalian B-cell, for production of hybridomas, wherein telomerase is expressed ectopically.

44. The immortal mammalian B-cell of claim 43 that is a murine immortal B-cell or a human immortal B-cell.

45. The immortal mammalian B cell of claim 44 that has been modified to ectopically express telomerase constitutively by expressing a telomerase gene that is expressed from a constitutively active promoter.

46. An immortal mammalian lymphoblastoid cell that ectopically expresses telomerase.

47. A method of producing a hybridoma that ectopically expresses telomerase, comprising fusing an immortal mammalian cell line that ectopically expresses telomerase with a fusion partner, under conditions appropriate for production of hybridomas, thereby producing a hybridoma that ectopically expresses telomerase.

48. The method of claim 47, wherein the immortal mammalian cell line is a human cell line or a murine cell line and the fusion cell is a human cell.

49. The method of claim 48, wherein the immortal mammalian cell line is a myeloma cell line and the fusion partner is a B-lineage cell.

50. The method of claim 27, wherein the myeloma cell line is a murine cell line and the B-lineage cell is an antigen-stimulated human peripheral blood mononuclear cell.

51. A hybridoma produced by the method of claim 47.

52. A hybridoma produced by the method of claim 48.

53. A hybridoma produced by the method of claim 49.

54. A hybridoma produced by the method of claim 50.

55. A method of producing human monoclonal antibodies, comprising maintaining a hybidoma that ectopically expresses telomerase under conditions appropriate for the production of monoclonal antibodies by the hybridoma, thereby producing monoclonal antibodies.

56. A method of producing human monoclonal antibodies, comprising: (a) fusing an immortal mammalian cell line that ectopically expresses telomerase with a human fusion partner, under conditions appropriate for hybridoma formation, thereby producing hybridomas that ectopically express telomerase and (b) maintaining hybridomas produced in (a) under conditions appropriate for production of monoclonal antibodies by the hybridomas, whereby human monoclonal antibodies are produced.

57. The method of claim 56, wherein the immortal mammalian cell line has been modified to ectopically express telomerase constitutively by expressing a telomerase gene that is expressed from a constitutively active promoter.

58. The method of claim 57, wherein the immortal mammalian cell line is of human or murine origin.

59. A hybridoma that ectopically expresses telomerase.

60. The hybridoma of claim 59 which is a murine hybridoma, a human hybridoma, or a murine/human hybridoma.

61. A method of producing a hybridoma that produces antibodies that bind an antigen expressed by a malignant cell, comprising fusing an immortal cell line that ectopically expresses telomerase with a fusion cell that is a malignant cell, under conditions appropriate for formation of hybridomas, whereby a hybridoma that produces antibodies that bind the antigen expressed by the malignant cell is produced.

62. The method of claim 61, wherein the malignant cell is selected from the group consisting of: a solid malignant tumor cell and a hematopoietic tumor cell.

63. The method of claim 62, wherein the solid tumor is selected from the group consisting of: a gastrointestinal tumor, a breast tumor, a kidney tumor, a brain tumor, a liver tumor, a stomach tumor, a lung tumor, a pancreatic tumor, a tumor of the reproductive systems, a prostate tumor, an eye tumor, a skin tumor, a melanoma, adenomas, polyps, dysplasias, in situ carcinomas, and intra-epithelial neoplasms and the hematopoietic tumor cell is selected from the group consisting of: leukemia, lymphoma, or myeloma, and myelodysplastic syndromes.

64. A method of producing a hybridoma that expresses antibodies that bind an antigen expressed by a pathogen, comprising fusing an immortal cell line that ectopically expresses telomerase with fusion cells that are B-lineage cells from

an individual who is or has been infected with the pathogen, under conditions appropriate for formation of hybridomas, whereby a hybridoma that produces antibodies that bind the antigen expressed by the pathogen is produced.

65. The method of claim 45, wherein the pathogen is selected from the group consisting of: a RNA virus, a DNA virus, a bacterium, an intracellular parasite, a fungus, a helminth and a protozoan.

66. The method of claim 65, wherein the RNA virus is a member of a RNA virus family selected from the group consisting of: Picornaviridae, Calciviridae, Togaviridae, Flaviviridae, Coronaviridae, Rhabdoviridae, Filoviridae, Paramyxoviridae, Orthomyxoviridae, Bunyaviridae, Arenaviridae, Reoviridae and Retroviridae

67. The method of claim 65, wherein the DNA virus is a member of a DNA virus family selected from the group consisting of: Hepadnaviridae, Parvoviridae, Papovaviridae, Adenoviridae, Herpesviridae and Poxviridae and Hepatitis.

68. The method of claim 65, wherein the bacterium is selected from the group consisting of: gram-positive cocci, gram positive bacilli, gram-negative bacteria, anaerobic bacteria, organisms of the families Actinomycetaceae, Bacillaceae, Bartonellaceae, Bordetellae, Captophagaceae, Corynebacteriaceae, Enterobacteriaceae, Legionellaceae, Micrococcaceae, Mycobacteriaceae, Nocardiaceae, Pasteurellaceae, Pseudomonadaceae, Spirochaetaceae, Vibrionaceae and organisms of the genera Acinetobacter, Brucella, Campylobacter, Erysipelothrix, Ewingella, Francisella, Gardnerella, Helicobacter, Levinea, Listeria, Streptobacillus and Tropheryma.

69. The method of claim 65, wherein the intracellular parasite is selected from the group consisting of: Chlamydiaceae, Mycoplasmataceae, Acholeplasmataceae,

Rickettsiae and organisms of the genera Coxiella and Ehrlichia.

70. The method of claim 65, wherein the fungus is selected from the group consisting of: Aspergillus, Blastomyces, Candida, Coccidioides, Cryptococcus, Histoplasma, Paracoccicioides, Sporothrix, organisms of the order Mucorales, organisms inducing choromycosis and mycetoma and organisms of the genera Trichophyton, Microsporum, Epidermophyton, and Malassezia.

71. The method of claim 65, wherein the helminth is selected from the group consisting of: Nematodes, Trematodes and Cestodes.

72. The method of claim 65, wherein the protozoan is selected from the group consisting of: organisms of the phylum Sarocomastigophora, the phylum Apicomplexa, the phylum Ciliophora, the phylum Microspora, and Pneumocystis carinii.

73. A method of producing a hybridoma that produces antibodies that bind an antigen expressed by a malignant cell, comprising fusing an immortal cell line that ectopically expresses telomerase with a fusion cell that is a malignant cell, under conditions appropriate for formation of hybridomas, whereby a hybridoma that produces antibodies that bind the antigen expressed by the malignant cell is produced.

74. A method of producing a hybridoma that produces antibodies that bind a self-antigen, comprising fusing an immortal cell line that ectopically expresses telomerase with a fusion cell obtained from a person who is or has been affected by an autoimmune disease, under conditions appropriate for formation of hybridomas, whereby a hybridoma that produces antibodies that bind the self-antigen is produced.

75. A method of producing a hybridoma that produces antibodies that bind a prion antigen, comprising fusing an immortal cell line that ectopically expresses telomerase with a fusion cell obtained from a person who is or has been affected by a prion disease, under conditions appropriate for formation of hybridomas, whereby a hybridoma that produces antibodies that bind the prion antigen is produced.

76. A method of producing a hybridoma that produces antibodies that bind an antigen in an antigen preparation, comprising fusing an immortal cell line that ectopically expresses telomerase with a fusion cell that has been stimulated in vitro in the presence the antigen preparation, under conditions appropriate for formation of hybridomas, whereby a hybridoma that produces antibodies that bind an antigen in the antigen preparation is produced.

77. A DNA construct useful for introducing DNA that encodes telomerase into a mammalian cell to modify the cell to ectopically express telomerase, comprising: (a) a telomerase gene; and (b) DNA that undergoes homologous recombination with a region of genomic DNA of the mammalian cell in such a manner that introduction of the telomerase gene into the genomic DNA of the mammalian cell places it under control of transcription regulatory elements of the mammalian cell that direct constitutive expression of the telomerase gene in the mammalian cell.

78. The DNA construct of claim 77 which is a plasmid or a viral vector.

79. A DNA construct useful for introducing DNA to modify a mammalian cell to ectopically express an endogenous telomerase gene, comprising: a constitutively active promoter flanked by DNA that undergoes homologous recombination with the genomic DNA of the mammalian cell in such a manner that the constitutively active promoter is introduced into a site from

which it directs the constitutive ectopic expression of an endogenous telomerase gene in the mammalian cell.

80. The DNA construct of claim 79, wherein the DNA that undergoes homologous recombination with genomic DNA is homologous to DNA of the endogenous telomerase gene promoter.

81. The DNA construct of claim 80 which is a plasmid or a viral vector.